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A COLLECTION OF MAMMALS FROM SUMATRA, WITH A REVIEW OF THE GENERA NYCTICEBUS AND TRAGULUS.

BY WITMER STONE AND J. A. G. REHN.

The Academy of Natural Sciences of Philadelphia has recently received, through the generosity of Mr. Alfred C. Harrison, Jr., and Dr. H. M. Hiller, a valuable zoölogical collection from Sumatra, which was made by them during their exploration of the island, from August to November, 1901.

The mammals contained in this collection form the basis of the present paper. The authors are also indebted to the U. S. National Museum for the privilege of examining certain specimens in connection with their study of the genus *Nycticebus*, the material having been loaned by Mr. Gerrit S. Miller, Jr., Assistant Curator of Mammals.

The Harrison and Hiller collection comprises sixty-five specimens, secured mainly at Goenong Soegi, Lampong District, at an elevation of less than 500 feet, and partly in the highlands of Padang Bovenland, at Batu Sangkar, Tanah Datar, 1,500 to 3,000 feet.

Sus vittatus Müll. and Schl.

Sus vittatus Müll. and Schl., Vech. I, p. 172, Pls. 29 and 32, fig. 5.

Two head skins and skulls, male and female, loaned for examination by Dr. Hiller appear to belong to this species.

Tragulus napu (Cuv.).

Moschus napu (F. Cuvier), Hist. Nat. des Mam., IV, livre 37, November, 1822.

Three specimens, Goenong Soegi, Lampong District, October–November, 1901. These agree very well with the figure in the *Hist. Nat. des Mam.;* the color of the dorsal surface, the limbs and the sides agreeing very closely, the only difference being the presence of a well-defined transverse gular bar which is absent or else very faintly defined in the figure.

Tragulus kanchil (Raffles).

1822. *Moschus kanchil* Raffles, Trans. Linn. Soc. London, XIII, p. 262.

The relationship and synonymy of this species are discussed below. There is one skin in the collection from Goenong Soegi, Lampong District.

Revision of the Genus Tragulus.—The consideration of the proper specific appellation for the above species has led to a study of the nomenclature of the entire genus, the results of which are given below. The synonymy of the Chevrotains has long been intricately involved, although Blanford in his *Mammals of British India* has simplified it to a considerable extent. The main faults with his revision are his failure to recognize two apparently well-marked species and his misapplication of the name *javanicus*.

Exclusive of the new forms recently described by Mr. G. S. Miller, Jr., which are accompanied by such detailed diagnoses and exact localities that they can easily be identified, there seem to be six distinct species of *Tragulus* from the Indo-Malay region. These may be considered in groups as follows:

(1) The mottled *T. meminna* Erxl., about which there is no confusion.

(2) *T. stanleyanus* Gray, which is equally distinct.

(3) The "Napu," the largest of the group, and the one called by Blanford and other authors "*T. napu.*"

(4) Three small species which Blanford unites under the name "*T. javanicus.*"

One of these three is unquestionably the *Moschus javanicus* of Gmelin, which has for its basis the description of Pallas, *Spicil. Zool.*, XII, p. 18. And as Blanford considered the three as representing but one species, he did perfectly right in adopting this name, which was apparently the oldest known to him.

The trouble is that Osbeck, in 1765, independently described a Chevrotain as *Cervus javanicus*, and by those who begin with the tenth edition of Linnæus this name must be considered. Osbeck's description is far from satisfactory, but applies without question to a species of *Tragulus*.[1] He comments on the lack of horns and describes the dentition of what he considers the male, though the length of the upper canines (equal to the incisors) indicates a female, then he says, "Die Farbe ist braunröthlich. Der Bock . . . . ist grösser als das Thier, und hat weisse Seiten streifen, die der Länge nach laufen."

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[1] His "nine back teeth" are accounted for by the ridges of the posterior molars, each of which he evidently took for a separate tooth!

Taken altogether there seems little doubt that he had a female of the "Napu" and a female of the smaller Chevrotain of Java. The former from its larger size he regarded as the male, and the white stripes could easily be accounted for by the whitish mottlings and lighter bases to the hairs on the sides of the "Napu," which produce the appearance of irregular stripes when the skin is wrinkled or the hair disturbed, and contrast strongly with the uniform coloration of the sides of the smaller species.

If this view be accepted, the name *T. javanicus* Osbeck will have to be applied to the "Napu," as the whole of Osbeck's description applies to the "Buch" or larger of his specimens. This view we propose to follow.

If, on the other hand, it is claimed that Osbeck's description is not sufficiently clear to refer it to a definite species it will nevertheless preclude the use of the later *javanicus* Gmelin, since Osbeck certainly described some species of Chevrotain. The larger animal (the "Napu") will then be known as *T. napu* Cuvier and the smaller one as *T. pelandoc* (Ham. Smith). His description[2] and reference to the plate of the "Pygmy Musk" in Shaw's *Naturalists' Miscellany,* I, Pl. III, seem to sufficiently indicate the small Javan Chevrotain, but the further description given by Blyth[3] leaves no doubt about the animal that he had in view.

Whether the "Napu" of Java is identical with that of Sumatra we are unable to say, but from the tendency it has to vary in each island, as shown by G. S. Miller's recent papers, it seems hardly likely, and we prefer to use *Tragulus napu* Cuvier for the Sumatran animal, leaving *T. javanicus* Osbeck for the Javan form. Should they prove identical the latter name of course must prevail.

Having disposed of the name *javanicus* and the two species upon which it has been bestowed, we come to the consideration of the relationship of the three small Chevrotains which are united under "*Tragulus javanicus*" in Blanford's work. The Javan species we have already shown must be known as *Tragulus pelandoc* Ham.

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[2] *Vide* Griff., *Anim. Kingdom,* IV, p. 66, 1827.

[3] *Proc. As. Soc. Bengal,* 1858, p. 277.

Smith. The Sumatran animal, the *Moschus kanchil* of Raffles, seems from specimens before us to be perfectly distinct. It is well described by Raffles[4] and by Blyth,[5] and can always be distinguished by the fact that the two dark stripes on the throat are joined together anteriorly while in *T. pelandoc* they are separate, never forming a complete ∧. The third species which Blanford has apparently failed to recognize as distinct is the *Tragulus rufiventer* of Gray[6] an animal resembling *T. kanchil* in pattern of markings, but of a very different color, being very bright tawny with nearly the whole of the belly distinctly fulvous. Gray attributes this species with a query to Malacca and the Indian Peninsula, while a specimen, No. 642 Coll. Acad. Nat. Sci., acquired many years ago, is simply labeled "India."

The following table will give an idea of the relationship of the several species—exclusive of those recently described by Mr. Miller:

a.—Body spotted, chin and throat hairy, . . . *T. meminna.*

b.—Body not spotted, chin and longitudinal strip between the rami of the mandible nearly or quite naked.

I.—Larger, length 25 ins. or more.

a′.—Color above brilliant orange-rufous, hairs tipped with black from the shoulders back, a black median longitudinal stripe down the face and a dark line from the eye to the nose. Hair on neck above and below coarse and rough. Diagonal orange lines on lower neck broad and united posteriorly by a transverse band, forming a triangle open at the apex, a pale-buff band down centre of belly, branching out to the base of the limbs, . . *T. stanleyanus.*

b′.—Color above blackish with fulvous bases to the hairs. Head and neck mixed with buff, darkest on top of head, down the middle of the face and a band down the nape. Sides of body becoming nearly white at base of hair with dark-brown tips, rest of lower parts white except marks on neck, which are of the same pattern as in the last, but diagonal stripes longer and narrower, ... *T. napu.*

Perhaps identical with this is . . . *T. javanicus.*

II. —Smaller, length 18–21 ins. General color yellowish-brown with black tips to the hair, lighter on sides, under parts white and forelegs distinctly orange-rufous.

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[4] *Trans. Linn. Soc.*, XIII, p. 262.

[5] *Proc. Asiat. Soc. Bengal*, 1858, p. 276.

[6] *P. Z. S.*, 1836, p. 65.

a'.—Sides of neck, diagonal stripes and back nearly the same color, top of head darker and a strongly marked black longitudinal stripe on the nape from the occiput to the shoulders, where it shades into the general color of the back. Diagonal stripes on the neck united anteriorly as well as at the base, making a complete triangle, a slender brown median stripe between the forelegs, ... *T. kanchil.*

b'.—Similar, but sides of neck and diagonal stripes on lower throat distinctly gray, contrasting with the yellow-brown of the back, darker nape band obsolete, and diagonal stripes always separated anteriorly, *T. pelandoc.*

c'.— Very different, and smallest of the group. Prevailing color dark orange-rufous, most of the hairs with black tips, producing a rich brown appearance on back and top of head; stripe on nape black, in sharp contrast to the sides of the neck; diagonal stripes orange-rufous mingled with black-tipped hairs joined anteriorly and posteriorly, leaving only a narrow white median stripe, a transverse rufous band at the base of the mandible; middlle of belly uniform light orange-rufous, leaving only the inside of the flanks and a spot on each side at the base of the forelegs white, . *T. fulviventer.*

Tragulus meminna (Erxl.).

1777. *Moschus meminna* Erxl., Syst. Reg. An., p. 322.
1843. *Meminna indica* Gray, List Mam. Brit. Mus., p. 172.

Hab.—Peninsnlar India and Ceylon.

Tragulus stanleyanus (Gray).

1836. *Moschus Stanleyanus* Gray, Proc. Zool. Soc., p. 65.

Hab.—Malacca, Java.

Tragulus javanicus (Osbeck).

1765. *Cervus javanicus* Osbeck, Reise nach Ostindien und China, p 357.
1858. *Tragulus fuscatus* Blyth, Jour. As. Soc. Beng., XXVII, p. 278.
1843. *Tragulus javanicus* Gray, List. Mam. Brit. Mus., p. 173.

Hab.—Java.

Tragulus napu (F. Cuv.).

1822. *Moschus napu* F. Cuv., Hist. Nat. Mam., Pl. 329.
1822. *Moschus javanicus* Raffles, Trans. Linn. Soc., XIII, p. 262.

Hab.—Sumatra.

Tragulus pelandoc (Ham. Smith).

1827. *Moschus Pelandoc* Ham. Smith, Griff., Anim. Kingdom, IV, p. 66.
1788. *Moschus javanicus* Gm., Syst. Nat., I, p. 174 (nec. Osbeck).
Tragulus javanicus Auct.

Hab.—Java.

Tragulus fulviventer (Gray).

1836. *Moschus fulviventer* Gray, Proc. Zool. Soc., p. 65.

Hab.—" Malacca and Indian Peninsula ?"

Tragulus nigricans Thomas.

1892. *Tragulus nigricans* Thomas, Ann. Mag. Nat. Hist., 6th Series, IX, p. 254.

Hab.—Philippines (no specimen examined).

Tragulus mimenoides Hodgs. Jour. As. Soc. Bengal.
Tragulus malaccensis Gray, Cat. Mam., 1843.

These are nomina nuda and have no standing.

Rusa unicolor equinus (Cuvier).

1823. *Cervus equinus* Cuvier, Ossemens Fossiles, 2d Ed., IV, p. 45.

One skin of a young male. Goenong Soegi.

Mus alexandrinus Geoffroy.

1818. *Mus alexandrinus* Geoffroy, Description de l'Egypte, Mammiferes, p. 733.

Five specimens in spirits. Batu Sangkar, Tanah Datar, Padangsche Bovenland. August–September.

Sciurus vittatus Raffles.

1822. *Sciurus vittatus* Raffles, Trans. Linn. Soc., London, XIII, p. 259.

Two specimens, male and female. Batu Sangkar, Tanah Datar, Padangsche Bovenland. August or September.

Mr. Bonhote, in his recent review of this group,[7] states that the red tip to the tail is a conspicuous and constant mark. The male of the above pair has it, but the female has not, so that it would seem to be of doubtful value as a diagnostic character.

Sciurus prevostii harrisoni subsp. nov.

One specimen, No. 6,651, Coll. Acad. Nat. Sci., Phila. Goenong Soegi, Lampong District, Sumatra. Coll. Alfred C. Harrison, Jr., and Dr. H. M. Hiller. October–November, 1901.

Apparently very similar to *S. prevostii bangkanus* of Schlegel, as defined by J. L. Bonhote,[8] but with slight grayish white tips to the hairs of the tail, from near the base to within about an inch of the tip. Very distinct from *S. p. rafflesi.* Pure black above, bright "orange-rufous" (Ridgway) below (contrasting strongly with the color of *rafflesi,* which is nearly the "bay"of Ridgway). White stripe on the side as in *rafflesi,* though the orange-rufous comes higher up on the outside of the hind legs. Sides of face iron-gray, but lighter than in *rafflesi,* almost white on the sides of the nose, chin of the same color as the cheeks without the longitudinal black line of *rafflesi.* A number of black hairs on the sides of the body adjoining the white stripe are tipped with orange-rufous, and those farther back with white; hairs of tail tipped with grayish-white as above described.

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[7] *Ann. and Mag. Nat. Hist.*, 7th Series, VII, pp. 444–445.

Dimensions as in *S. p. rafflesi.*

We should hesitate to describe another race of these squirrels were it not for Mr. Bonhote's statements regarding their constancy within geographic limits and the fact that no rufous-bellied member of the group has apparently been hitherto found on Sumatra.

The occurrence of this animal side by side with *S. p. rafflesi* makes us strongly suspect that the two are specifically distinct, but without more material it would be impossible to decide upon the proper arrangement of all the members of the group, should that view be accepted.

Sciurus prevostii rafflesii (Vigors and Horsf.).

1828. *Sciurus Rafflesii* Vigors and Horsf., Zool. Jour., IV, p. 113.

Five specimens from Goenong Soegi, Lampong District. October–November.

Funambulus insignis (Desmarest).

1822. *Sciurus insignis* Desmarest, Mammalogie, II, p. 544.

One male. Goenong Soegi, Lampong District. October and November.

This specimen seems to approach to *F. i. diversus* Thomas,[9] being indeed quite red on the sides and the white of the under part distinctly red-tinted. We have no other specimens for comparison, however.

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[8] *Ann. Mag. Nat. Hist.*, 7, VII, pp. 171, 177.

[9] *Ann. and Mag.* (7), II, p. 248.

Ratufa bicolor hypoleuca (Horsfield).

1824. *Sciurus hypoleucos* Horsfield, Zool. Res. in Java (pages not numbered).

One specimen. Goenong Soegi, Lampong District. October and November.

As compared with two Javan examples, this specimen seems quite distinct. It is decidedly lighter, the central dorsal region being straw color instead of dull ochraceous, the rump pale-brown with ochraceous hairs interspersed instead of blackish-brown with silvery hairs; the under fur of the upper parts is smoky-gray instead of blackish-brown, and the ventral surface almost pure white instead of tinged with pale ochraceous.

Horsfield's specimen came from Sumatra and seems to agree with the one in hand.

Ratufa affinis (Raffles).

1822. *Sciurus affinis* Raffles, Trans. Linn. Soc., London, XIII, p. 259.

Two specimens, male and female. Goenong Soegi, Lampong District. October and November.

The male is darker than the female, especially the tail, which is nearly chocolate color instead of ochraceous brown; the white of the head is also more clearly defined.

Tupaia tana Raffles.

1822. *Tupaia tana* Raffles, Trans. Linn. Soc., London, XIII, p. 257.

Six specimens. Goenong Soegi, Lampong District. October and November.

These specimens seem to be all referable to the above species, although they present considerable variation in color and size.

The largest is nearly black above with an underlying tint of maroon, while the hairs of the head and shoulders are finely annulated with buff; below it is dull maroon, the tail a brighter shade of the same.

Another nearly the same size is lighter above with the buff annulations prevailing over the shoulders, and extending back nearly to the tail on some of the hairs. Tail bright maroon above and below, under parts bright tawny with a tinge of maroon.

Two small specimens, apparently young, have a still greater admixture of buff on the head, shoulders and back, while the under parts are more tinged with buff. The skulls are much shorter with the protruding maxillaries less developed.

Galeopithecus volans (Linn.).

Five specimens of this interesting animal were obtained. They exhibit some variation in the color of the back, one being distinctly browner than the others, but without material for comparison it would be impossible to say whether they are identical with specimens from other parts of the Malay region. The nomenclature of the animal is somewhat involved, and a number of proposed names would have to be considered if a subdivision should be deemed desirable. Geoffroy[10] proposed three species, *rufus*, *variegatus* and *ternatensis.* The descriptions are very brief and for only one is the type locality given, *i.e.*, *T. variegatus* from Java. *G. ternatensis* is based upon Seba's plate, which was also in part the basis of Linnæus' *Lemur volans.*

Temminck, in the introduction of his *Monogr. Mammalium*, states that there are only two species of *Galeopithecus*, and that Geoffroy's three species are not valid. He does not, however, name his "two species."

Fischer also recognizes two species, calling the Malay one *volans* and the Philippine one *variegatus* Geof., in spite of the fact that the latter name was based on a Javan specimen! He also mentions that Temminck recognized two species, "*G. variegatus*, from Java and islands of the Indian Archipelago, and *G. marmoratus*, from Sumatra and Borneo." Where Temminck described *G. marmoratus* we have been unable to discover, though Wagner in Schreber's *Saugthiere*, Suppl. I, p. 324, says "fauna japon. auct. Siebold."

Blainville, in his *Osteographie*, fasc. 3, p. 48, also quotes Temminck's two species giving the latter one as "*macrurus !*"

Waterhouse first clearly separated the Philippine species as *G. philippensis*,[11] and at the same time named the species of the Indian Archipelago *G. temmincki.*

Wagner in Schreber's *Saugthiere* also proposes *G. undatus* for an animal which he thinks may be the same as *G. marmoratus* Temm. The Sumatran animal, if distinct, should bear Wagner's name, unless it is found that Temminck actually did publish a diagnosis of his *G. marmoratus.* The other names, it seems to us, must all be regarded as synonyms of *G. volans* Linn., except, of course, *G. philippensis* Waterhouse.

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[10] *Cours d' Hist. Nat.*, 1829, p. 37.

[11] *P. Z. S.*, 1838, p. 119.

Pteropus vampyrus (Linnæus).

1758. [*Vespertilio*] *vampyrus* Linnæus, Syst. Nat., X ed., p. 31.

Six specimens, five in spirits, one skin. Batu Sangkar, Tanah Datar, Padangsche Bovenland. August or September.

One skin. Goenong Soegi, Lampong District. October or November.

Cynopterus titthæcheilus (Temminck).

1827. *Pteropus titthæcheilus* Temminck, Monogr. Mamm., I, p. 198.

Two alcoholic specimens. Batu Sangkar, Tanah Datar, Padangsche Bovenland. August or September.

One alcoholic specimen. Goenong Soegi, Lampong District. October or November.

Pipistrellus tenuis (Temminck).

1827. *Vespertilio tenuis* Temminck, Monogr. Mamm., II, p. 229.

One alcoholic specimen. Batu Sangkar, Tanah Datar, Padangsche Bovenland. August or September.

One alcoholic specimen. Goenong Soegi, Lampong District. October or November.

Felis bengalensis Kerr.

1792. *Felis bengalensis* Kerr, Animal Kingdom, p. 151.

Three kittens in spirits. Batu Sangkar, Tanah Datar, Padangsche Bovenland. August or September.

Arctogale leucotis Blyth.

1851. Horsfield's Catalogue, East India Mus., p. 66.

One adult male.

Putorius nudipes F. Cuv.

1823. *Putorius nudipes* F. Cuv., Mam. Lith., III, Pl. 149.
1863. *Gymnopus leucocephalus* Gray, P. Z. S., p. 119.

One specimen of a bright golden-yellow with grayish-white head. From Lampong District.

This animal is unquestionably the *leucocephalus* of Gray, and since he refers to Cuvier's earlier name I have no doubt but they are identical, though I have not been able to consult Cuvier's plate.

Revision of the Genus Nycticebus.—The identification of the specimens of Slow Loris in the collection has led to a study of the several allied species and the nomenclature of the genus, with some interesting results.

These Lemurs fall naturally into two very distinct groups: (1)

The Slender Loris, "*Loris gracilis*" of most authors; and (2) the Slow Loris and its allies, "*Nycticebus tardigradus*" Auct.

The first specific name to be proposed for any of them was *Lemur tardigradus.*[12] This was based upon the following references:

(1) L. ecaudatus, *Mus. Ad. Fr.*, I, p. 3.
(2) Simia ecaudata unguibus indicis subulatis.[13]
(3) Animal cynocephalum tardigradum.[14]
(4) Animal elegantissimum robinsonii.[15]

The first reference seems to refer exclusively to the Slender Loris, the habitat being Ceylon and the characters given "naso productiore brachiis manibus pedibusque longis tenuibus."

The second is a mere catalogue name. Under the third come two plates of Seba with long descriptions; the first unquestionably refers to the Slender Loris, while, although the text to the second plate seems to refer in part to the Slow Loris, the figure itself looks more like the Slender Loris.

The last reference is again the Slender Loris from "Ceylon," and the produced rostrum is especially mentioned.

It will thus be seen that, with the exception of the second plate of Seba, which is of rather doubtful application, all of the quotations upon which *Lemur tardigradus* Linn. are based refer to the Slender Loris, "*L. gracilis*" Auct., and it is remarkable that the name should have been so universally applied to the *Nycticebus.*

Another important point brought out in our investigation is the failure of apparently all authors to consider Boddaert's observations on these animals, *Elenchus animalium,* p. 67 (1784). He there proposes a genus *Tardigradus* with two species, *T. loris* = Slender Loris and *T. coucang* = Slow Loris, and correctly refers *Lemur tardigradus* Linn. to the former.

As this is the first attempt to establish a separate genus for these animals, the name *Tardigradus* must be adopted for the Slender Loris. Furthermore, *coucang* being the first name proposed for the Slow Loris must be adopted for it.

Geoffroy did not propose his genus *Loris* until 1796, in *Magasin Encyclopedique,* Vol. I, pp. 48–49. This work being inaccessible to us, we are indebted to Mr. Outram Bangs for a transcript of the reference, from a copy in the Boston Public Library. From this it seems that *Loris* Geoff. is a synonym of *Tardigradus* Bodd., being based upon the same two animals, *L. gracilis* = Slender Loris and *L. tardigradus* = Slow Loris. Although Geoffroy undoubtedly had the Slow Loris in mind for his second species, as shown by his reference to Vosmaer, whose plate is excellent, nevertheless in referring it to *L. tardigradus* Linn. he originated the unfortunate error which has been almost universally followed by subsequent authors. The genus *Nycticebus* proposed by Geoffroy in 1812 was unquestionably based upon the Slow Loris, and will hold for it and its allies, unless *Bradycebus* Cuv. et Geoffr. is available. Their genus is said to be published in *Mem. Class. Mamm.* and in *Mag. Encyclop.*, but we have not yet been able to locate it.

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[12] Linnæus, *Syst. Nat.*, X, p. 29.
[13] *Syst. Nat.*, 5, n. 2.
[14] *Seb. Mus.*, I, p. 55, t. 35, f. 1, 2; t. 47, f. 1.
[15] *Ray. Quad.*, p. 161.

We shall have then the following synonymy for these genera:

TARDIGRADUS Bodd.

1784. Tardigradus Bodd., Elenchus Anim., p. 67 (type *T. loris* Bodd. = *Lemur tardigradus* Linn.).
1796. Loris Geoff., Mag. Encyclop., I, pp. 48–49.
1811. Stenops Illig., Prodrom. Syst. Mam. et Avium, p. 73.

NYCTICEBUS Geoff.

1812. Nycticebus Geoff., Ann. du Mus. Paris, XIX, p. 162. Type.
? 1795. Bradycebus Cuv. et Geoffr., Mem. Class. Mamm.

After studying a number of specimens, partly from the Academy's collection and partly loaned by the U. S. National Museum through Mr. G. S. Miller, Jr., Assistant Curator of Mammals, it appears that the variation in the Slow Lemurs, recognized by Anderson and Blanford as simply varietal, is worthy of a more definite treatment.

It would seem from the material at our disposal that there are five distinct forms, which we would regard as subspecies rather than as species, as they are obviously geographic races of one species. The *N. menagensis* of the Philippines has not been considered, as no specimens are available and it is therefore impossible to judge of its relationship with the Malayan group.

The forms may be distinguished as follows:

a.—General color ashy-gray, slightly tinged with rufous. Crown of head without an extensive patch of brown.
    b.—Head with indistinct lines extending to the eyes and ears. Dorsal line fading away on crown of head, *coucang* Boddaert.

bb.—Head with four distinct lines extending to a common centre on the crown of the head. Dorsal line distinct on the crown of head, . . *c. javanicus* E. Geoffroy.

aa.—General color rufescent gray. Crown of head with a considerable blotch of brown.

b.—General tint pale rufescent; dorsal line and crown patch not very distinctly marked and of a rufous tint, the latter involving the ears, . *c. malaianus* Anderson.

bb.—General tint deep rufescent; dorsal line and crown patch very distinct and of a deep chestnut tint, the latter not involving the ears, . . . *c. natunæ* n. subsp.

bbb.—General color chestnut rufescent, more or less washed with gray; dorsal line very distinct, deeply colored; crown patch large, fading into the general surrounding tint, ... *c. hilleri* n. subsp.

Regarding the Tenasserim form[16] we can say nothing, as no specimens from that region are available.

Nycticebus coucang hilleri n. subsp.

1822. *Lemur tardigradus* Raffles (not of Linn.), Trans. Linn. Soc. London, XIII, p. 247.

Type. ♂, No. 6,590, Acad. Nat. Sci. Phila. Batu Sangkar, Tanah Datar, Padangsche Bovenland, Sumatra. August or September, 1901. Collected and presented by Mr. A. C. Harrison, Jr., and Dr. H. M. Hiller.

Distribution.—Specimens from the type locality only have been examined, but it is possible the form is found throughout the island.

Characters.—This form is most nearly related to *malainus* and *javanicus*, but differs from the former in the much more strongly marked dorsal line, and in the predominance of chestnut-brown and not ochraceous in the general tint. From *javanicus* it differs in the much less definite head bars, in the broad crown patch and in the gradual transition from the latter to the surrounding tint.

Color.—General color of the upper parts reddish-cinnamon (between Ridgway's russet and cinnamon), more or less washed with ecru, the more noticeable toward the extremities. Dorsal line very distinct, seal-brown and more or less visible to the caudal region. Crown patch broad, mars brown with the four head bars not well marked, all merging gradually into the general hoary tint which suffuses the head; eyes surrounded by the customary black ring; interocular stripe clear white; cheeks whitish, sometimes slightly suffused with blackish-gray. General color of the lower surface pale fawn, throat whitish.

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[16] *Vide* Blansford, *Mamm. Brit. Ind.*, pp. 45 and 46.

Specimens examined.—Three in spirits, all from the type locality.

Nycticebus coucang javanicus (E. Geoffroy).

1812. *Nycticebus javanicus* E. Geoffroy, Ann. du Museum, XIX, p. 164.

Type locality and distribution.—Java.

Two specimens examined: Java, Acad. Nat. Sci. Phila.

Nycticebus coucang natunæ n. subsp.

1894. *Nycticebus tardigradus* Thomas and Hartert, Novitates Zoologicæ, I, p. 655.
1895. *Nycticebus tardigradus* Thomas and Hartert, Novitates Zoologicæ, II, p. 489.
1901. *Nycticebus tardigradus* Miller, Proc. Wash. Acad. Sci., III, p. 138.

Type. ♂, No. 104,599, United States National Museum, Bungaran, Natuna Islands, July 28, 1900. Collected and presented by Dr. W. L. Abbott.

Distribution.—As far as known only the type locality.

Characters.—Comparison of this form with any others of the species is unnecessary as the color and pattern are quite distinctive.

Color.—General color of the upper parts rich russet brown (close to mars brown of Ridgway), palest on the limbs, strongest on the shoulders. Dorsal line rich vandyke brown, tending toward seal brown, the stripe brown on the shoulder, decreasing in width and intensity posteriorly, becoming almost obsolete on the rump; general tint on each side of the dorsal line is overcast with a silvery "bloom," which is caused by the tips of the hairs being of that tint.[17] Crown patch broad, rich burnt umber, extending from ear to ear, but not involving them, anteriorly sending a broad bar to the upper margin of the customary black ocular rings; cheeks suffused with dusky brown. Anterior limbs with the extremities much lighter in color than the remainder of the limbs. Lower surface pale cinnamon, throat silvery white.

Specimens examined.—One, the type.

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[17] The hair on all the dorsal surface is more or less tipped with silvery, but this character is much more apparent in the portion mentioned above. The presence of the silvery suffusion near the dorsal line is shared by *javanicus*, but in that form distinct longitudinal bars are formed.

Nycticebus coucang (Boddaert).

1783. *Tardigradus coucang* Boddaert, Elenchus Animalium, p. 67.
1812. *Nycticebus bengalensis* É. Geoffroy, Ann. du Museum, XIX, p. 164.
1867. *Nycticebus cinereus* Milne-Edwards, Nouv. Archiv. du Museum Bull., III, p. 11.

Type locality.—Bengal.

Distribution.—According to Anderson,[18] this form is found from Assam through Upper Burma to Siam.

No specimens are available for examination.

Nycticebus coucang malaianus (Anderson).

1881. *Nycticebus tardigradus* var. *malaiana* Anderson, Catal. Mamm. Ind. Mus., I, p. 95.

Type locality.—None stated.

Distribution.—Chittagong, through Arakan at least as far south as Tringanu, Lower Siam.

Two specimens examined: "Bengal," Acad. Nat. Sci. Phila.; Tringann, Malay Peninsula, U. S. N. M.

Semnopitheous melalophos (Raffles).

1822. *Simia melalophos* Raffles, Trans. Linn. Soc., London, XIII, p. 245.

Two specimens in spirits. Batu Sangkar, Tanah Datar, Padangsche Bovenland. August or September. These specimens still retain the milk dentition, and the dusky suffusion of the upper parts extends along the upper surface of the tail.

One skin. Goenong Soegi, Lampong District. October or November.

This specimen has the upper parts much lighter and more uniformly colored than the alcoholic specimens.

Semnopitheous maurus (Schreber).

1775. *Simia maura* Schreber, Säugthiere, I, p. 107, Pl. XXII B.

Two skins. Goenong Soegi, Lampong District. October and November.

Semnopitheous mitratus (Esch.).

Adult female and young. Lampong.

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[18] *Catal. Mamm. Ind. Mus.*, I, p. 95.

Symphalangus[19] **syndactylus** (Raffles).

1822. *Simia syndactyla* Raffles, Trans. Linn. Soc. London, XIII, p. 241.

One old male, preserved entire in spirits. Batu Sangkar, Tanai Datar, Padangsche Bovenland. August or September. And two males and a female, Goenong Soegi. October and November. The first specimen measures:

Length, crown to anus, ...	531 mm.
Extreme reach from tip of longest fingers (approximately), ...	1536 mm.
Length of forearm, ...	309 mm.

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[19] For the adoption of *Symphalangus* Gloger (*Hand.-u. Hilfsb. Naturgesch.*, I, p. 34, 1841) in place of *Siamanga* Gray (*List. Mam. Brit. Mus.*, p. 1, 1843), see Palmer, *Science*, n. s., X, p. 493, 1899.